

General Description

The Sanrise SRT04N016LS is a low voltage power MOSFET, fabricated using advanced split gate trench technology. The resulting device has extremely low on resistance, low gate charge and fast switching time, making it especially suitable for applications which require superior power density and synchronous rectification.

The SRT04N016LS break down voltage is 40V and it has a high rugged avalanche characteristics. The SRT04N016LS is available in PDFN5*6 and TO-252 and TO-220C and TO-263-2 packages.

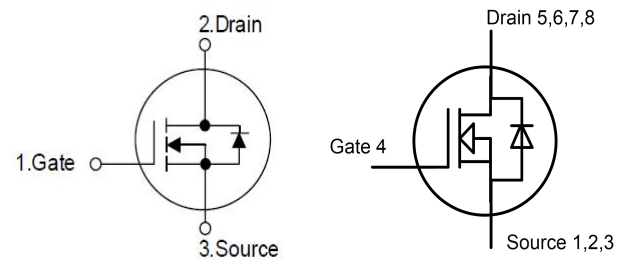
Features

- Ultra Low
 $R_{DS(ON_TYP)} = 1.15m\Omega, PDFN5*6 @V_{GS} = 10V.$
 $R_{DS(ON_TYP)} = 2.0m\Omega, TO-252 @V_{GS} = 10V.$
 $R_{DS(ON_TYP)} = 1.8m\Omega, TO-220C @V_{GS} = 10V.$
 $R_{DS(ON_TYP)} = 1.7m\Omega, TO-263-2 @V_{GS} = 10V.$
- Ultra Low Gate Charge, $Q_g=85nC$ typ.
- Fast switching capability
- Robust design with better EAS performance
- EMI Improved
- Non-automotive Qualified

Application

- Server/Telecom
- High Power Supply
- E-Tools
- BMS
- Motor Driver

Symbol



TO-252, TO-220C, TO-263-2

PDFN5*6

Figure 1 Symbol of SRT04N016LS

Package Type

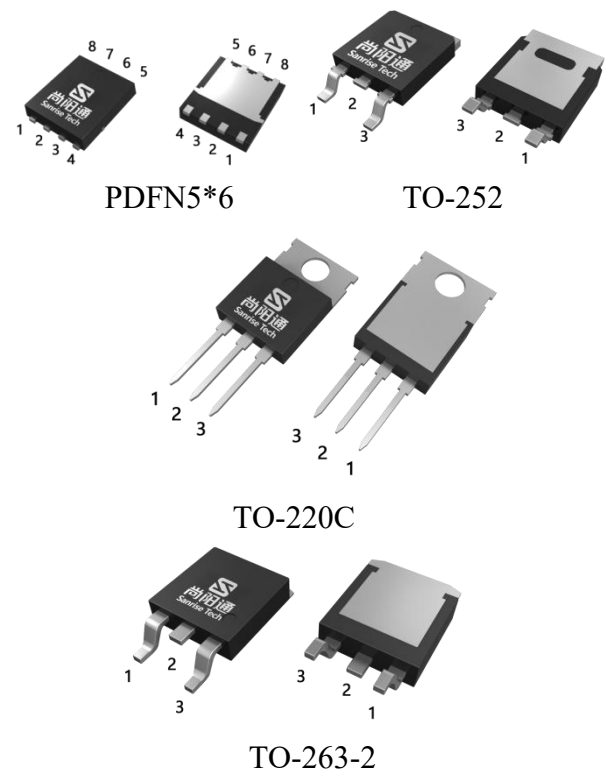
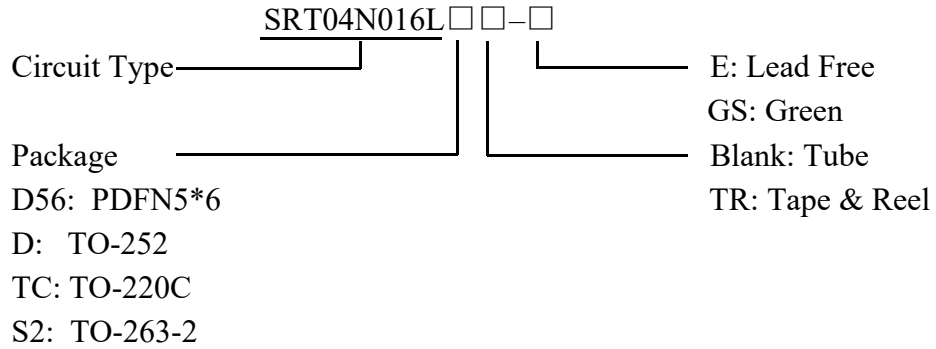


Figure 2 Package Type of SRT04N016LS

Ordering Information


Package	Part Number	Marking ID	Packing Type
PDFN5*6	SRT04N016LD56TR-GS	SRT04N016LD56GS	Tape & Reel
TO-252	SRT04N016LDTR-GS	SRT04N016LDGS	Tape & Reel
TO-220C	SRT04N016LTC-GS	SRT04N016LTCGS	Tube
TO-263-2	SRT04N016LS2TR-GS	SRT04N016LS2GS	Tape & Reel

Absolute Maximum Ratings

Parameter		Symbol	Rating	Unit	
Drain-Source Voltage		V_{DSS}	40	V	
Gate-Source Voltage		V_{GSS}	±20	V	
Continuous Drain Current, Silicon	$T_C=25^{\circ}C$	I_D	PDFN5*6	173	A
			TO-252	141	
			TO-220C	186	
	$T_C=100^{\circ}C$		TO-263-2	186	
			PDFN5*6	109	
			TO-252	89.5	
			TO-220C	118	
Pulsed Drain Current (Note 2)		I_{DM}	TO-263-2	118	
			PDFN5*6	692	A
			TO-252	564	
			TO-220C	744	
Avalanche Energy, Single Pulse (Note 3)		E_{AS}	81	mJ	
Avalanche Destructive Energy, Single Pulse (Note 4)		E_{AS_Limit}	756	mJ	
Avalanche Energy, Repetitive (Note 2)		E_{AR}	0.2	mJ	
Avalanche Current, Repetitive (Note 2)		I_{AR}	50.0	A	
Continuous Diode Forward Current		I_S	100	A	
Diode Pulse Current		$I_{S,PULSE}$	692	A	
Max Power Dissipation		P_D	104	W	
Operating Junction Temperature		T_J	150	°C	
Storage Temperature		T_{STG}	-55 to 150	°C	
Lead Temperature (Soldering, 10 sec)		T_{LEAD}	260	°C	

Note:

1. Absolute maximum ratings are those values beyond which the device could be permanently damaged. Absolute maximum ratings are stress ratings only and functional device operation is not implied.
2. Repetitive Rating: Pulse width limited by maximum junction temperature
3. $I_{AS}=18A$, $V_{DD}=20V$, $R_G=25\Omega$, Starting $T_J=25^{\circ}C$
4. $I_{AS_Limit}=55A$, $V_{DD}=20V$, $R_G=25\Omega$, Starting $T_J=25^{\circ}C$

Thermal Resistance

Parameter		Symbol	Min	Typ	Max	Unit
Thermal Resistance, Junction-to-Case	PDFN5*6	R_{thJC}			1.2	°C/W
Thermal Resistance, Junction-to-Ambient	PDFN5*6	R_{thJA}			50	
Thermal Resistance, Junction-to-Case	TO-252	R_{thJC}			1.2	°C/W
Thermal Resistance, Junction-to-Ambient	TO-252	R_{thJA}			60	
Thermal Resistance, Junction-to-Case	TO-220C	R_{thJC}			0.8	°C/W
Thermal Resistance, Junction-to-Ambient	TO-220C	R_{thJA}			60	
Thermal Resistance, Junction-to-Case	TO-263-2	R_{thJC}			0.8	°C/W
Thermal Resistance, Junction-to-Ambient	TO-263-2	R_{thJA}			60	

Electrical Characteristics

 T_J = 25°C, unless otherwise specified.

Parameter		Symbol	Test Conditions	Min	Typ	Max	Unit
Statistic Characteristics							
Drain-Source Breakdown Voltage		BV _{DSS}	V _{GS} =0V, I _D =250uA	40			V
Zero Gate Voltage Drain Current		I _{DSS}	V _{DS} =40V, V _{GS} =0V			1	uA
Gate-Body Leakage Current	Forward	I _{GSSF}	V _{GS} =20V, V _{DS} =0V			200	nA
	Reverse	I _{GSSR}	V _{GS} =-20V, V _{DS} =0V			-200	
Gate Threshold Voltage		V _{GS(TH)}	V _{DS} =V _{GS} , I _D =0.25mA	1.2	1.8	2.4	V
Static Drain-Source On-Resistance	PDFN5*6	R _{DS(ON)}	V _{GS} =10V, I _D =50A		1.15	1.6	mΩ
			V _{GS} =4.5V, I _D =50A		2.0	3.05	
	TO-252		V _{GS} =10V, I _D =50A		2.0	2.5	
			V _{GS} =4.5V, I _D =50A		2.6	3.5	
	TO-220C		V _{GS} =10V, I _D =50A		1.8	2.2	
			V _{GS} =4.5V, I _D =50A		2.3	3.5	
	TO-263		V _{GS} =10V, I _D =50A		1.7	2.2	
			V _{GS} =4.5V, I _D =50A		2.2	3.5	
Gate Resistance		R _G	f=1MHz, Open Drain		1.3		Ω
Dynamic Characteristics							
Input Capacitance		C _{ISS}	V _{DS} =20V, V _{GS} =0V, f=1MHz		5.8		nF
Output Capacitance		C _{OSS}			1.6		nF
Reverse Transfer Capacitance		C _{RSS}			98		pF
Effective output capacitance, energy related ^{NOTE5}		C _{O(er)}	V _{GS} =0V, V _{DS} =0...32V		2.4		nF
Effective output capacitance, time related ^{NOTE6}		C _{O(tr)}			3.0		
Turn-on Delay Time		t _{d(on)}	V _{DD} =20V, I _D =50A R _G =1.6Ω, V _{GS} =10V		18		ns
Rise Time		t _r			55		
Turn-off Delay Time		t _{d(off)}			60		
Fall Time		t _f			12		
Gate Charge Characteristics							
Gate to Source Charge		Q _{gs}	V _{DD} =20V, I _D =50A V _{GS} =0 to 10V		12.5		nC
Gate to Drain Charge		Q _{gd}			9.5		
Gate Charge Total		Q _g			85		
Gate Plateau Voltage		V _{plateau}			2.3		V
Gate Charge Total, sync FET		Q _g	V _{DD} =0.1V, V _{GS} =0 to 10V		79		nC
Reverse Diode Characteristics							
Drain-Source Diode Forward Voltage		V _{SD}	V _{GS} =0V, I _{SD} =50A		0.84	1.0	V
Reverse Recovery Time		t _{rr}	V _R =20V, I _F =50A dI _F /dt=100A/us		60		ns
Reverse Recovery Charge		Q _{rr}			120		nC
Peak Reverse Recovery Current		I _{rrm}			4.0		A

Note:

 5. C_{O(er)} is a fixed capacitance that gives the same stored energy as C_{OSS} while V_{DS} is rising from 0 to 32V

 6. C_{O(tr)} is a fixed capacitance that gives the same charging time as C_{OSS} while V_{DS} is rising from 0 to 32V



Sanrise Technology Limited Company

<http://www.sanrise-tech.com>

IMPORTANT NOTICE

Shenzhen Sanrise Technology Co., LTD. reserves the right to make changes without further notice to any products or specifications herein. Shenzhen Sanrise Technology Co., LTD. does not assume any responsibility for use of any its products for any particular purpose, nor does Shenzhen Sanrise Technology Co., LTD. assume any liability arising out of the application or use of any its products or circuits. Shenzhen Sanrise Technology Co., LTD. does not convey any license under its patent rights or other rights nor the rights of others.

Main Site:

- Headquarter

Shenzhen Sanrise Technology Co., LTD.

A1206, Skyworth building, No. 008, gaoxinnan 1st Road,
Gaoxin District, Yuehai street,, Nanshan District, ShenZhen,
P.R.China

Tel: +86-755-22953335

Fax: +86-755-22916878

- Shanghai Office

Sanrise Technology Limited Company

Rm.401, Building B, No. 666, Zhangheng Road,
Zhangjiang Hi-Tech Park, Shanghai, P.R.China

Tel: +86-21-68825918